Italian Journal of Zoology

ISSN: 1125-0003 (Print) 1748-5851 (Online) Journal homepage: http://www.tandfonline.com/loi/tizo20

The rediscovery of Rosalinda incrustans (Cnidaria: Hydrozoa) in the Mediterranean Sea

F. Mastrototaro, R. Aguilar, G. Chimienti, C. Gravili & F. Boero

To cite this article: F. Mastrototaro, R. Aguilar, G. Chimienti, C. Gravili & F. Boero (2016): The rediscovery of Rosalinda incrustans (Cnidaria: Hydrozoa) in the Mediterranean Sea, Italian Journal of Zoology

To link to this article: http://dx.doi.org/10.1080/11250003.2016.1181800

Published online: 21 May 2016.

Italian Journal of Zoology, 2016, 1–4
http://dx.doi.org/10.1080/11250003.2016.1181800

Taylor & Francis
Taylor & Francis Group

The rediscovery of *Rosalinda incrustans* (Cnidaria: Hydrozoa) in the Mediterranean Sea

F. MASTROTOTARO[1]*, R. AGUILAR[2], G. CHIMIENTI[1], C. GRAVILI[3], & F. BOERO[3,4]

[1]*University of Bari, Department of Biology and CoNISMa LRU, Italy,* [2]*OCEANA, Spain,* [3]*University of Salento, Laboratory of Zoology and Marine Biology, Dipartimento di Scienze e Tecnologie Biologiche e Ambientali (Di.S.Te.B.A.), Italy, and* [4]*CNR-ISMAR, Institute of Marine Sciences of the Italian National Research Council, Italy*

(Received 1 March 2016; accepted 18 April 2016)

Abstract
The present note reports a new record of *Rosalinda incrustans* (Cnidaria: Hydrozoa) since its last reliable record in the Mediterranean Sea in 1958. Several colonies were recorded on the spider crab *Anamathia rissoana* off the Balearic Islands. The taxonomic history of *R. incrustans*, considered a putatively extinct species in a recent paper, is reviewed.

Keywords: *Rosalinda, Hydrozoa,* Anamathia, *epibiosis, Mediterranean Sea*

Introduction

Rosalinda incrustans (Kramp, 1947) was collected during the "Skagerak" Expedition in the eastern Atlantic, growing on the crab *Anamathia rissoana* (Roux, 1828). Kramp (1947) originally referred it to the genus *Halocharis* (?) L. Agassiz, 1862, now a synonym of *Zanclea* Gegenbaur, 1857 (see Schuchert 2010). Later, Picard (1957) ascribed the nominal species to the genus *Rosalinda*, proposed by Totton (1949) to accommodate an apparently similar species, *Rosalinda williami* (Totton 1949), that he found in the Bay of Biscay growing on a worm tube and on the coral *Desmophyllum cristagalli* Milne Edwards and Haime, 1848. Bouillon (1985) proposed the family Rosalindidae to accommodate the species of *Rosalinda*. Watson (1978) described *Rosalinda marlina* (Watson 1978) from Australian waters, growing on barnacles. Antsulevich and Stepanjants (1985) described a *Zanclea*-like medusa from a colony of *Rosalinda naumovi* (Antsulevich & Stepanjants 1985) growing on a bivalve shell from the Kurile Islands. So far, the genus *Rosalinda* comprises these four species, each growing on different substrates, some living in shallow waters, others living in the deep sea. Bouillon et al. (2006) placed the Rosalindidae in the Suborder Zancleida Russell, 1953 and grouped them with the Teissieridae Bouillon, 1974 due to the shared presence of an encrusting hydrorhiza forming a crust-like stolonal plate. The Teissieridae, however, have polymorphic colonies, whereas the Rosalindidae are monomorphic. The medusae of the Teissieridae are similar to those of *Zanclea*, but have ocelli, a feature absent in *Zanclea*. Too little is known about the medusae of *Rosalinda*, since Antsulevich and Stepanjants (1985) did not describe the development and observed preserved material only. Also, the cnidome of *Rosalinda* is poorly known, since the preserved material observed so far did not allow the observation of discharged cnidocysts.

This is the first documented record of *R. incrustans* in the Mediterranean Sea after 1958 when it was collected from the Rosas Gulf (Spain) (Bouillon et al. 1995; Schuchert 2010). Bo et al. (2014: 117-118) possibly recorded it off the coasts of Montecristo Island (Tyrrhenian Sea, Western Mediterranean Sea), in 2012, but referred to it as "unidentified athecate hydroids" growing on *A. rissoana*. Their picture and the identity of the substrate are sufficient to ascribe their material to *R. incrustans*.

*Correspondence: F. Mastrototaro, Department of Biology, Local Research Unit CoNISMA, University of Bari, Via E. Orabona 4, 70125 Bari, Italy. Tel: +39 080 5443344. Fax: +39 080 5442871. Email: francesco.mastrototaro@uniba.it

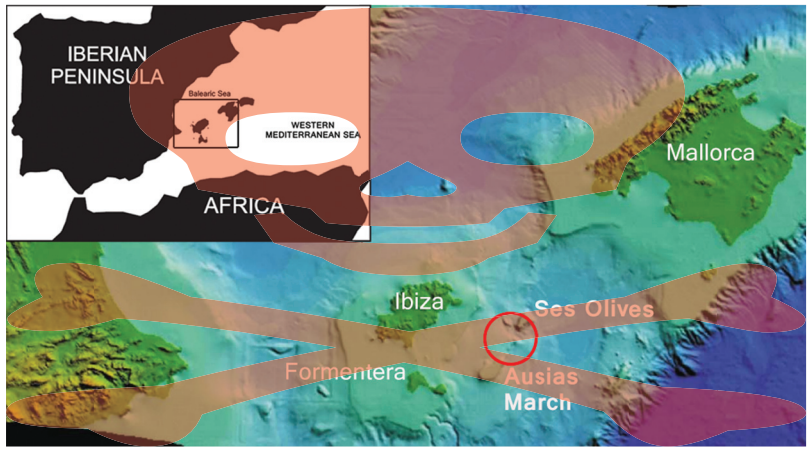

Figure 1. The Mallorca Channel (Balearic Sea). The area of the facies of *Isidella elongata* where *Rosalinda incrustans* was observed is circled (modified from Acosta et al. 2003).

This is the first time that the shape of living colonies is documented, all other records being based on preserved and much-contracted material.

Materials and methods

Rosalinda incrustans was found during the oceanographic cruise BALSEA 2014 in the Mallorca Channel (Balearic Sea), between Ausias March and Ses Olives seamounts (Figure 1), in the upper slope east of Ibiza (Acosta et al. 2001). In this area a wide facies of the candelabrum-shaped alcyonacean *Isidella elongata* Esper, 1788 was present from 485 to 616 m in depth (Chimienti et al. 2015). The exploration of such facies was performed from the Ketch Catamaran *Ranger* using a Saab Seaeye Falcon DR ROV (Remotely Operated vehicle) equipped with an HDV (High Definition Video) camera of 480 TVL with Minimum Scene Illumination 2.0 LUX (F1.4), Pick Up Device ½" CCD, Image Sensor and spherical ½ of 3.8 mm and wide angle lenses. An area of about 1.500–1.800 m^2 was surveyed. All specimens of the spider crab *A. rissoana* were photographed and carefully observed to check for any epibiotic species.

Results

A total of seven specimens of *A. rissoana* were observed, and five of them proved to be colonized by *R. incrustans* (Figure 2).

All specimens of *A. rissoana* were photographed on living colonies of the bamboo coral *I. elongata*, often colonized by several specimens of the epibiotic actinia *Amphianthus dohrnii* (Koch, 1878). On some colonies was observed the presence of shark eggs (Figure 2D), likely of the blackmouth catshark *Galeus melastomus*.

Systematics

Class: Hydroidomedusa Claus, 1877
Subclass: Anthomedusae Haeckel, 1879
Order: Capitata Kühn, 1913
Suborder: Zancleida Russell, 1953
Family: Rosalindidae (Bouillon, 1985)
Genus: *Rosalinda* (Totton, 1949)
Species: *R. incrustans* (Kramp, 1947)

New record

2014, Mallorca Channel, Balearic Sea, Western Mediterranean Sea, colony photographed on the carapace and dorsal spines of the crab *A. rissoana*.

Previous records in the Mediterranean Sea

1958, Rosas, Gulf of Lion, Western Mediterranean Sea (Bouillon et al. 1995);
1958, West of Corsica (Schuchert 2010).
2012, off the coasts of Montecristo Island, Western Mediterranean Sea (Bo et al. 2014: 117–118, as "unidentified athecate hydroids").

Description

The colonies of *R. incrustans* covered both the carapace and dorsal spines of specimens of the spider crab *A. rissoana*. The identification of *R. incrustans* (white arrows in Figure 2) was mainly based on its species-specific association with the spider crabs *A. rissoana* and on the evident zancleid appearance of the hydranths which are very elongate, with scattered tentacles throughout their

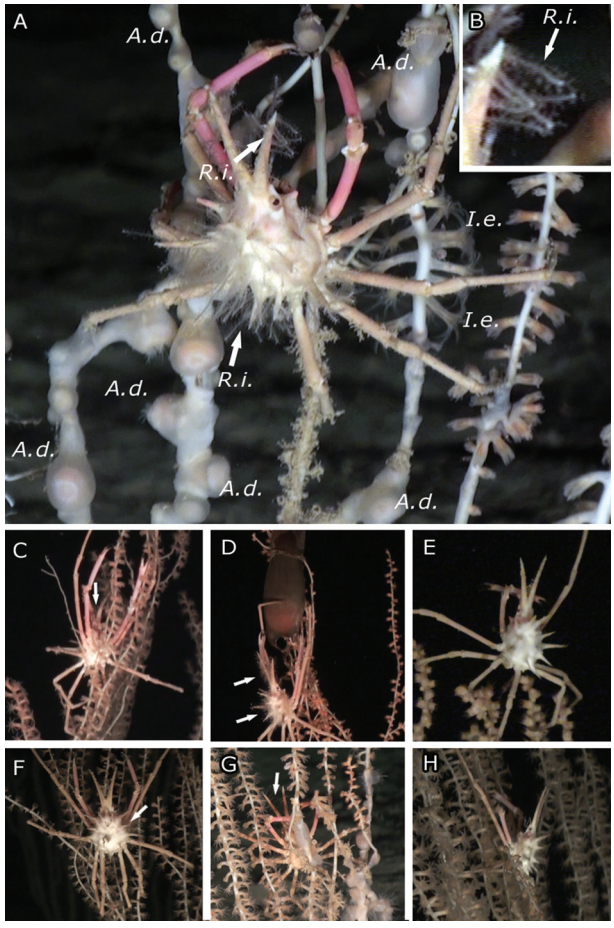

Figure 2. (A) The spider crab *Anamathia rissoana* with colony of *Rosalinda incrustans* on its carapace and/or dorsal spines (white arrows); in the upper right corner (B), the enlarged view of a crab's rostrum colonized by a colony of *R. incrustans*; in the photos below, all specimens of *A. rissoana* photographed with (C, D, F, G) or without (E, H) *R. incrustans* colonies on their carapace (white arrows). *R.i.: R. incrustans* colonies; *A.d.: Amphianthus dohrnii* specimens; *I.e.: I. elongata* polyps.

column (white arrow in Figure 2B) and a distinctively white hypostome, with a circlet of 4–5 tentacles. It was impossible to distinguish the organization of the hydrorhiza described by Schuchert (2010). Medusa buds were not observed.

Remarks

Living hydranths are very slender and elongated, whereas the club-shaped appearance reported by Schuchert (2010) is probably due to the contraction of preserved material. The pictures show a white hypostome and a set of oral tentacles that were not reported by Schuchert (2010).

Ecology

Colonies of *R. incrustans* occur epizoically only on the deep-sea spider crab *A. rissoana* at depths of about 200–800 m, as documented by Kramp (1947), Vervoort (1966), Bouillon et al. (1995, 2004) and Schuchert (2010).

Distribution

Atlantic Ocean, west of Gibraltar (off SW of Portugal, 36.667° N 14.250° W), Western Mediterranean (Corsica and Costa Brava, 42.355° N, 09.611° W; off the coasts of Montecristo Island, 42.170° N, 10.175° E; 42.250° N, 10.040° E) (Kramp 1947; Picard 1957; Bouillon et al. 1995; Schuchert 2010; Bo et al. 2014).

Discussion

The present finding represents the first documented observation of living *R. incrustans* in its natural habitat, namely the dorsal spines and the carapace of the crab *A. rissoana*. In particular, more than 70% of the spider crabs observed were colonized by this hydroid.

Gravili et al. (2015) labelled *R. incrustans* as a case of putative extinction, attributing to this species a Confidence of Extinction Index equal to 100% due to the lack of reliable records since 1958. The present record and that of Bo et al. (2014) demonstrate that the absence of records of *R. incrustans* is probably due to simple lack of investigation in the habitat of the species. The use of new technologies for marine habitat investigations with high-resolution video recording, such as ROV, increases the chances of finding and observing animals in their natural habitats, proving essential for *in situ* studies of deep-sea species. Moreover, this kind of video survey allowed us to observe that a great number of the colonies of *I. elongata* in the area were largely colonized by the actinia *A. dohrnii*, already known as commensal species of some deep-sea anthozoans such as *Madrepora oculata* Linnaeus, 1758, *Leiopathes glaberrima* (Esper, 1788) and *Paramuricea macrospina* (Koch, 1882) (Mastrototaro et al. 2010). However, in this specific case, this actinia seems to widely cover the bamboo coral as an ectoparasite, as some zoanthids do on certain sponges in shallower waters (i.e. *Parazoanthus axinellae* on the sponges of the genus *Axinella*; Cerrano et al. 2006).

Acknowledgements

This paper was funded by the Adessium Foundation, Robertson Foundation, *Fundación Biodiversidad* and

Spanish *Ministerio de Agricultura, Alimentación y Medio Ambiente*. The publication of this paper is supported by CoNISMa, the Italian National Interuniversity Consortium for Marine Sciences. FB received financial support from the EU FP7/2007-2013, Grant Agreement No. 287844 for the project "CoCoNet".

References

Acosta J, Canals M, López-Martínez J, Muñoz A, Herranz P, Urgeles R, Palomo C, Casamor JL. 2003. The balearic promontory geomorphology (western Mediterranean): Morphostructure and active processes. Geomorphology 49:177–204. doi:10.1016/S0169-555X(02)00168-X.

Acosta J, Muñoz A, Herranz P, Palomo C, Ballesteros M, Vaquero M, Uchupi E. 2001. Pockmarks in the Ibiza Channel and western end of the Balearic Promontory (western Mediterranean) revealed by multibeam mapping. Geo-Marine Letters 21:123–130. doi:10.1007/s003670100074.

Antsulevich AE, Stepanjants SD. 1985. Novy predstavitel' redkogo roda *Rosalinda* (Hydroidea) v Dal'nevostochnykh vodakh. A new species of a rare genus *Rosalinda* (Hydroidea) in the Far East waters. Zoologichesky Zhurnal 64:1140–1147.

Bo M, Canese S, Bavestrello G. 2014. Discovering Mediterranean black coral forests: *Parantipathes larix* (Anthozoa: Hexacorallia) in the Tuscan Archipelago, Italy. Italian Journal of Zoology 81:112–125. doi:10.1080/11250003.2013.859750.

Bouillon J. 1985. Essai de classification des hydropolypes-hydroméduses (Hydrozoa- Cnidaria). Indo-Malayan Zoology 2:29–243.

Bouillon J, Gravili C, Pagés F, Gili J-M, Boero F. 2006. An introduction to Hydrozoa. Mémoires du Muséum national d'Histoire naturelle 194:1–591.

Bouillon J, Massin C, Kresevic R. 1995. Hydroidomedusae de l'Institut royal des Sciences naturelles de Belgique. In: Van Ghoethem J, editor. Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Brussels. Vol. 78:1–106.

Bouillon J, Medel MD, Pagès F, Gili J-M, Boero F, Gravili C. 2004. Fauna of the Mediterranean Hydrozoa. Scientia Marina 68(Suppl. 2):1–449. doi:10.3989/scimar.2004.68s25.

Cerrano C, Totti C, Sponga F, Bavestrello G. 2006. Summer disease in *Parazoanthus axinellae* (Schmidt, 1862) (Cnidaria, Zoanthidea). Italian Journal of Zoology 73:355–361. doi:10.1080/11250000600911675.

Chimienti G, Aguilar R, Mastrototaro F 2015. Facies of *Isidella elongata* (Esper, 1788): What are we loosing? Proceedings of the 76th National Conference of the Unione Zoologica Italiana. Quaderni del Centro Studi Alpino – IV. Università degli Studi della Tuscia. p. 125.

Gravili C, Bevilacqua S, Terlizzi A, Boero F. 2015. Missing species among Mediterranean non-Siphonophoran Hydrozoa. Biodiversity and Conservation 24:1329–1357. doi:10.1007/s10531-015-0859-y.

Kramp PL. 1947. Hydroids collected by the "Skagerak" expedition in the eastern Atlantic 1946. Göteborgs Kungl. Vetenskaps och Vitterhets-Samhalles Handlingar (B6) 5 (= Meddelanden fran Göteborgs Musei Zoologiska Avdelning, 115), Göteborg. pp. 1–16.

Mastrototaro F, D'Onghia G, Corriero G, Matarrese A, Maiorano P, Panetta P, Gherardi M, Longo C, Rosso A, Sciuto F, Sanfilippo R, Gravili C, Boero F, Taviani M, Tursi A. 2010. Biodiversity of the white coral bank off Cape Santa Maria di Leuca (Mediterranean Sea): An update. Deep Sea Research Part II: Topical Studies in Oceanography 57(5–6):412–430. doi:10.1016/j.dsr2.2009.08.021.

Picard J. 1957. Étude sur les hydroïdes de la superfamille Pteronematoidea, 1. Généralités. Bulletin de l'Institut océanographique de Monaco 1106:1–12.

Schuchert P. 2010. The European athecate hydroids and their medusae (Hydrozoa, Cnidaria): Capitata Part 2. Revue Suisse De Zoologie 117(3):337–555. doi:10.5962/bhl.part.117793.

Totton AK. 1949. An encrusting ceratellid hydroid *Rosalinda williami* gen. et sp. n. from the Bay of Biscay. British Sciencs News, London 3:45–47.

Vervoort W. 1966. Skeletal structure in the Solanderiidae and its bearing on hydroid classification. In: The Cnidaria and their evolution. Symposium of the Zoological Society of London 16. WJ Rees, editor. London: Academic Press. 373–396.

Watson JE 1978. New species and new records of Australian athecate hydroids. Proceedings of the Royal Society of Victoria 90:301–314.